

Zaki S. Ali

CONTACT INFORMATION UC Berkeley Dept. of Astronomy zakiali@berkeley.edu
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EDUCATION **Ph.D., Astrophysics, University of California, Berkeley** **August 2012-Present**

Advisor: Aaron Parsons

Expected Graduation: 2017

M.A., Astronomy, University of California, Berkeley **May 2015**

Bachelor of Arts, Astrophysics, University of California, Berkeley **May 2010**

Bachelor of Arts, Mathematics, University of California, Berkeley **May 2010**

RESEARCH INTERESTS 21 cm cosmology with an emphasis on data analysis techniques
Instrumentation of low frequency interferometers

PROFESSIONAL POSITIONS **Graduate Student Researcher** **August 2012 - Present**
U.C. Berkeley Dept. of Astronomy. Advisor: Aaron Parsons

Junior Specialist **June 2010 - June 2012**

Radio Astronomy Lab, U.C. Berkeley. Supervisor: Aaron Parsons

TEACHING EXPERIENCE **University of California, Berkeley, Department of Astronomy**

Optical Lab (Teaching Assistant) **Fall 2012**

Radio Lab (Teaching Assistant) **Spring 2013**

Cosmology (Teaching Assistant) **Spring 2015**

PRIMARY AUTHOR PUBLICATIONS **Z. S. Ali**, A. R. Parsons, H. Zheng, J. C. Pober, A. Liu, J. E. Aguirre, R. F. Bradley, G. Bernardi, C. L. Carilli, C. Cheng, D. R. DeBoer, M. R. Dexter, J. Grobelaar, J. Horrell, D. C. Jacobs, P. Klima, D. H. E. MacMahon, M. Maree, D. F. Moore, N. Razavi, I. I. Stefan, W. P. Walbrugh, and A. Walker, “*PAPER-64 Constraints on Reionization: The 21 cm Power Spectrum at $z = 8.4$* ”, *ApJ*, 809 (2015), p. 61.

J. C. Pober, **Z. S. Ali**, A. R. Parsons, M. McQuinn, J. E. Aguirre, G. Bernardi, R. F. Bradley, C. L. Carilli, C. Cheng, D. R. DeBoer, M. R. Dexter, S. R. Furlanetto, J. Grobbelaar, J. Horrell, D. C. Jacobs, P. J. Klima, S. A. Kohn, A. Liu, D. H. E. MacMahon, M. Maree, A. Mesinger, D. F. Moore, N. Razavi-Ghods, I. I. Stefan, W. P. Walbrugh, A. Walker, and H. Zheng, “*PAPER-64 Constraints On Reionization. II. The Temperature of the $z = 8.4$ Intergalactic Medium*”, *ApJ*, 809 (2015), p. 62.

A. R. Parsons, A. Liu, **Z. S. Ali**, and C. Cheng, “*Optimized Beam Sculpting with Generalized Fringe-Rate Filters*”, *ArXiv e-prints*: 1503.05564, (2015).

COLLABORATION PUBLICATIONS A. Ewall-Wice, R. Bradley, D. DeBoer, J. Hewitt, A. Parsons, J. Aguirre, **Z. S. Ali**, J. Bowman, C. Cheng, A. R. Neben, N. Patra, N. Thyagarajan, M. Venter, E. de Lera Acedo, J. S. Dillon, R. Doolittle, D. Egan, M. Hendrick, P. Klima, S. Kohn, P. Schaffner, J. Shelton, B. Saliwanchik, M. Tegmark, H. A. Taylor, R. Taylor, and B. Wirt, *The HERA Dish II: Electromagnetic Simulations and Science Implications*, *ArXiv e-prints*, (2016).

A. R. Neben, R. F. Bradley, J. N. Hewitt, D. R. DeBoer, A. R. Parsons, J. E. Aguirre, **Z. S. Ali**, C. Cheng, A. Ewall-Wice, N. Patra, N. Thyagarajan, J. Bowman, R. Dickenson, J. S. Dillon, P. Doolittle, D. Egan, M. Hedrick, D. C. Jacobs, S. A. Kohn, P. J. Klima, K. Moodley, B. R. B. Saliwanchik, P. Schaffner, J. Shelton, H. A. Taylor, R. Taylor, M. Tegmark, B. Wirt, and H. Zheng, *The Hydrogen Epoch of Reionization Array Dish I: Beam Pattern Measurements and Science Implications*, *ArXiv e-prints*, (2016).

S. A. Kohn, J. Aguirre, C. Nunhokee, G. Bernardi, J. Pober, **Z. Ali**, R. Bradley, C. Carilli, D. DeBoer, N. Gugliucci, D. Jacobs, P. Klima, D. MacMahon, J. Manley, D. Moore, A. Parsons, I. Stefan, and W. Walbrugh, Constraining Polarized Foregrounds for EoR Experiments I: 2D Power Spectra from the PAPER-32 Imaging Array, ArXiv e-prints, (2016).

D. Moore, J. E. Aguirre, S. Kohn, A. Parsons, **Z. Ali**, R. Bradley, C. Carilli, D. DeBoer, M. Dexter, N. Gugliucci, D. Jacobs, P. Klima, A. Liu, D. MacMahon, J. Manley, J. Pober, I. Stefan, and W. Walbrugh, New Limits on Polarized Power Spectra at 126 and 164 MHz: Relevance to Epoch of Reionization Measurements, ArXiv e-prints, (2015).

D. C. Jacobs, J. C. Pober, A. R. Parsons, J. E. Aguirre, **Z. S. Ali**, J. Bowman, R. F. Bradley, C. L. Carilli, D. R. DeBoer, M. R. Dexter, N. E. Gugliucci, P. Klima, A. Liu, D. H. E. MacMahon, J. R. Manley, D. F. Moore, I. I. Stefan, and W. P. Walbrugh, “Multiredshift Limits on the 21 cm Power Spectrum from PAPER”, ApJ, 801 (2015), p. 51.

A. R. Parsons, A. Liu, J. E. Aguirre, **Z. S. Ali**, R. F. Bradley, C. L. Carilli, D. R. DeBoer, M. R. Dexter, N. E. Gugliucci, D. C. Jacobs, P. Klima, D. H. E. MacMahon, J. R. Manley, D. F. Moore, J. C. Pober, I. I. Stefan, and W. P. Walbrugh, “New Limits on 21 cm Epoch of Reionization from PAPER-32 Consistent with an X-Ray Heated Intergalactic Medium at $z = 7.7$ ”, ApJ, 788 (2014), p. 106.

D. C. Jacobs, A. R. Parsons, J. E. Aguirre, **Z. Ali**, J. Bowman, R. F. Bradley, C. L. Carilli, D. R. DeBoer, M. R. Dexter, N. E. Gugliucci, P. Klima, D. H. E. MacMahon, J. R. Manley, D. F. Moore, J. C. Pober, I. I. Stefan, and W. P. Walbrugh, “A Flux Scale for Southern Hemisphere 21 cm Epoch of Reionization Experiments”, ApJ, 776 (2013), p. 108.

J. C. Pober, A. R. Parsons, J. E. Aguirre, **Z. Ali**, R. F. Bradley, C. L. Carilli, D. DeBoer, M. Dexter, N. E. Gugliucci, D. C. Jacobs, P. J. Klima, D. MacMahon, J. Manley, D. F. Moore, I. I. Stefan, and W. P. Walbrugh, “Opening the 21cm Epoch of Reionization Window: Measurements of Foreground Isolation with PAPER”, ApJ, 768 (2013), p. L36.

I. I. Stefan, C. L. Carilli, D. A. Green, **Z. Ali**, J. E. Aguirre, R. F. Bradley, D. DeBoer, M. Dexter, N. E. Gugliucci, D. E. Harris, D. C. Jacobs, P. Klima, D. MacMahon, J. Manley, D. F. Moore, A. R. Parsons, J. C. Pober, and W. P. Walbrugh, “Imaging on PAPER: Centaurus A at 148 MHz”, MNRAS, (2013).

J. C. Pober, A. R. Parsons, D. R. DeBoer, P. McDonald, M. McQuinn, J. E. Aguirre, **Z. Ali**, R. F. Bradley, T.C. Chang, and M. F. Morales, “The Baryon Acoustic Oscillation Broadband and Broad-beam Array: Design Overview and Sensitivity Forecasts”, AJ, 145 (2013), p. 65.

PROFESSIONAL TALKS

227th American Astronomical Society Meeting (January 2016): *21 cm Power Spectrum Upper Limits from PAPER-64*

UC Berkeley Thursday Lunch Talks (November 2015): *A Status Update on PAPER*

University of Kwazulu-Natal Cosmology Seminar (November 2015): *PAPER: An Experiment to Detect the Epoch of Reionization*

California Institute of Technology Tea Talk (June 2015): *PAPER: An Experiment to Detect the Epoch of Reionization*

The Olympian Symposium: Cosmology and the Epoch or Reionization (May 2015): *Enabling the 21 cm Power Spectrum with Advanced Analysis Techniques*

225th American Astronomical Society Meeting (January 2015): *New 21 cm Power Spectrum Upper Limit from PAPER I: Results from PAPER-64*

Early Science from Low-frequency Radio Telescopes (December 2014): *From PAPER-32 to PAPER-64: Lessons Learned*

Berkeley MWA Epoch of Reionization Workshop (June 2014): *A Status Update on PAPER*

SKILLS

Programming Languages

Python, Bash, L^AT_EX, HTML, CSS, Bootstrap, Simulink, Matlab, CASPER toolflow, SQL, C, C++, Cuda, VHDL, Verilog, Ruby.

Laboratory Skills

Experience with various lab equipment including oscilloscopes, multimeters, spectrum analyzers, network analyzers, power supplies (AC and DC), soldering, drill press, tapping holes, crimping, and setting up racks

Electronics Experience

Experience with many electronics components including, amplifiers, couplers, splitters, various types of filters, resistors, capacitors, inductors, attenuators, terminators, transformers.